Use of Hospital-specific Cutoffs to Evaluate NBS Specimen Transit Time

Mary Kleyn, MSc
Manager, Newborn Screening Follow-up Section

Michigan Department of Health and Human Services

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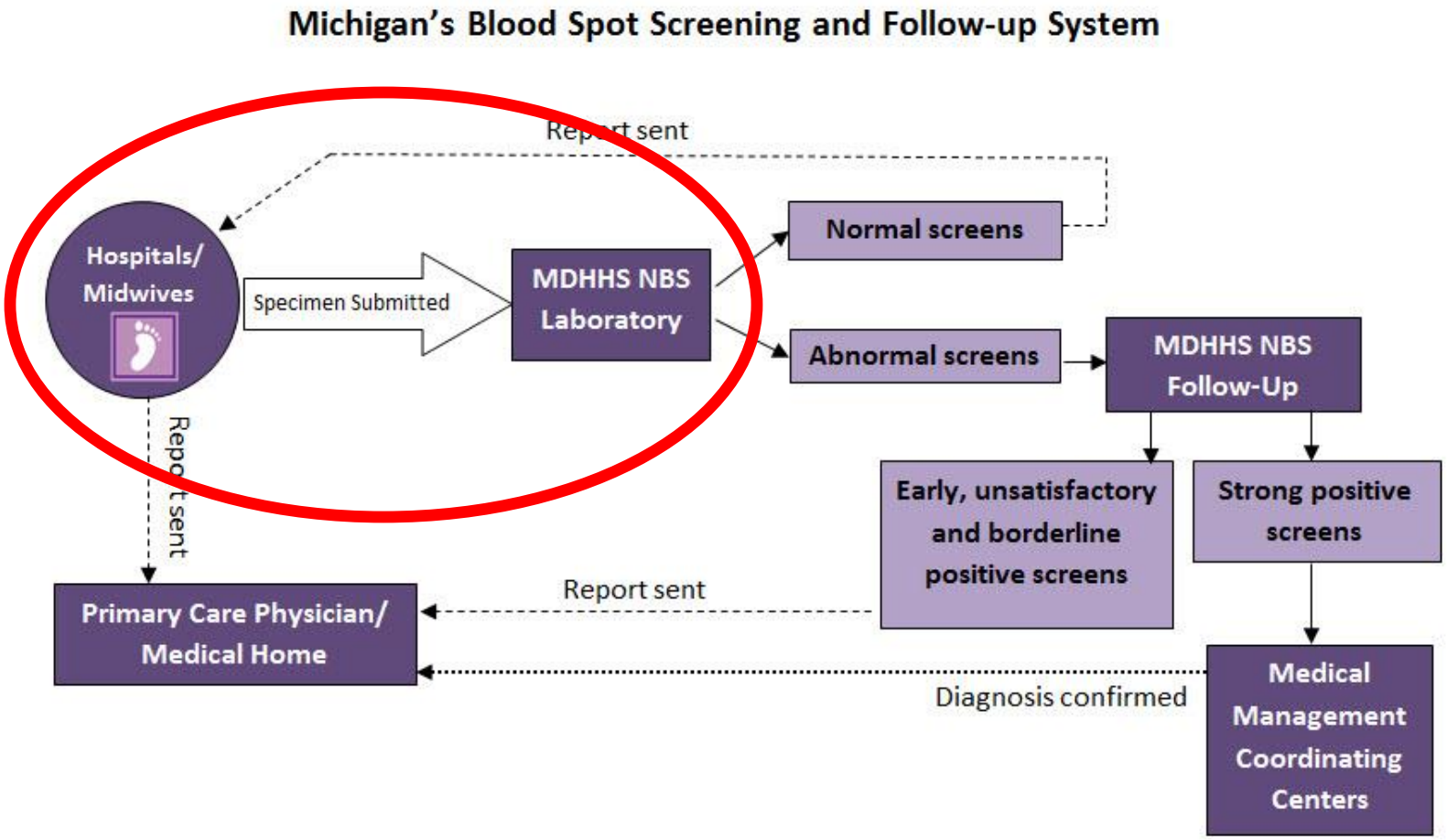
Background



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Background

* Importance of timely specimen delivery

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Background

* 83 birthing facilities in Michigan
* ~112,000 births per year
* NBS Program provides state-funded courier services
* NBS lab and follow-up operates Monday-Saturday

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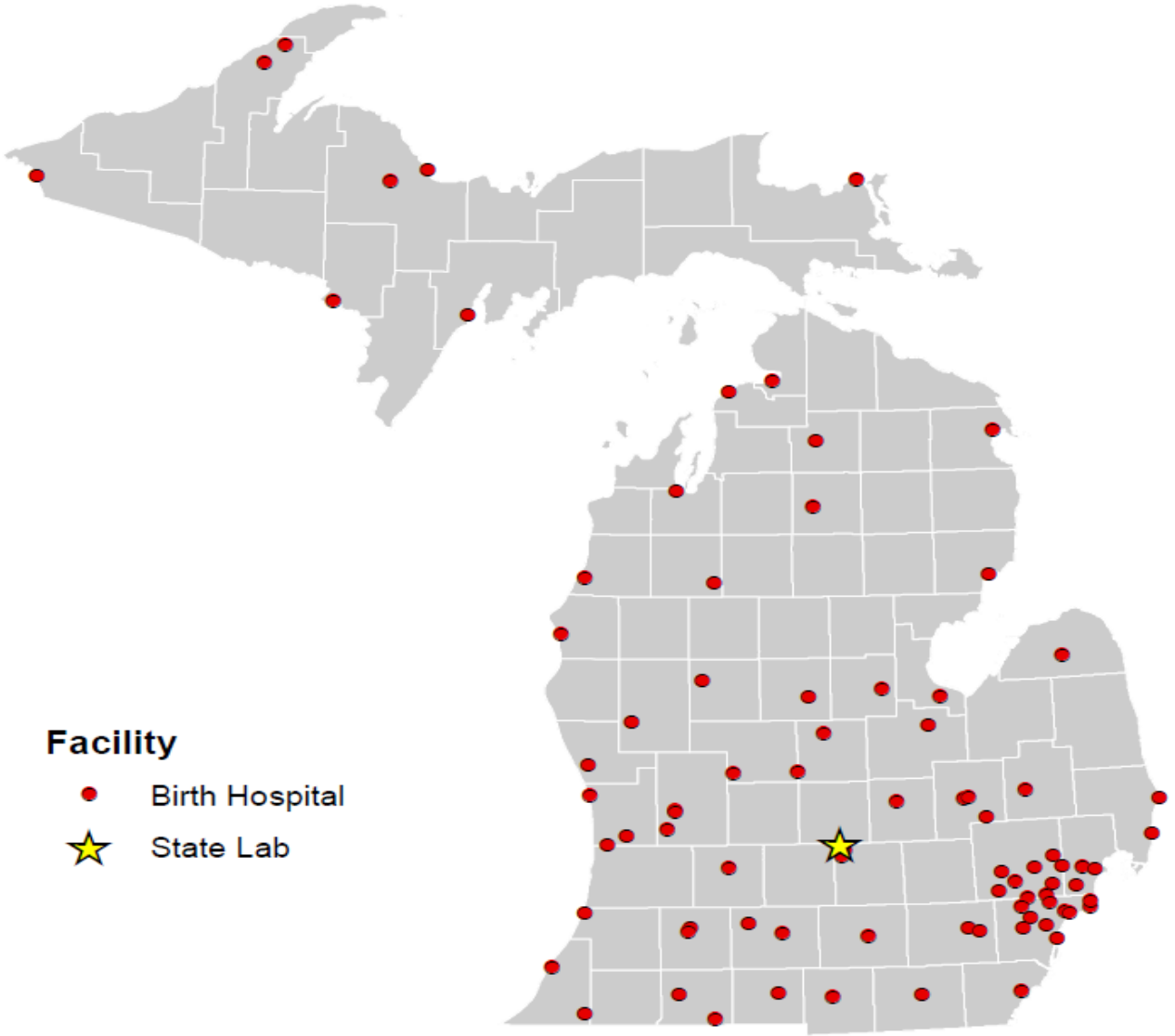
Courier Service



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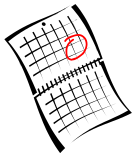
Quarterly Reports



* Sent to all NBS coordinators ~4 weeks after end of each quarter
* Contain data for 6 metrics
* Number and percentages for each metric are presented for each unit and statewide

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Quarterly Report Example

STATE OF MICHIGAN
DEPARTMENT OF COMMUNITY HEALTH
LANSING

RICK SNYDER
GOVERNOR

JAMES K. HAVEMAN
DIRECTOR

NEWBORN SCREENING QUALITY ASSURANCE NOTIFICATION Covering the period: 4/1/2014 - 6/30/2014

This quarterly report provides data on hospital performance measures. The report gives your hospital monthly and quarterly totals on initial specimens received and also provides a statewide comparison. The Newborn Screening Follow-up Program selected six performance measures and set a goal for each measure.

The goals are:

- **Late Screens:** Less than 2% of screens collected greater than 36 hours after birth
- **Receipt by Appropriate Day:** Greater than 90% of screens arrive in state laboratory by the appropriate day
- **Unsatisfactory Screens:** Less than 1% of screens are unsatisfactory (Unsatisfactory specimens based on initial and repeat screens received)
- **Newborn Screening Card Number:** Greater than 95% of electronic birth certificates have the newborn screening card number recorded
- **Returned BioTrust for Health Consent Forms:** At least 90% of specimens have a returned BioTrust for Health consent form that is completed appropriately
- **Reported Pulse Oximetry Screening Results:** At least 90% of newborns with a dried blood spot screen have pulse oximetry screening results reported

1 **STATE**

	April			May			June			Quarter		
Total number specimens for your hospital	9,230			9,836			9,432			28,498		
Total number of specimens for state	9,230			9,836			9,432			28,498		
	n	*%*	*Goal*	*n*	*%*	*Goal*	*n*	*%*	*Goal*	*n*	*%*	*Goal*
Late Screens for your hospital	133	1.4	Met	156	1.6	Met	141	1.5	Met	430	1.5	Met
Late Screens for state	133	1.4	Met	156	1.6	Met	141	1.5	Met	430	1.5	Met
Receipt by Appropriate Day for your hospital	7,454	80.8	Not Met	8,005	81.4	Not Met	7,581	80.4	Not Met	23,040	80.8	Not Met
Receipt by Appropriate Day for state	7,454	80.8	Not Met	8,005	81.4	Not Met	7,581	80.4	Not Met	23,040	80.8	Not Met
Unsatisfactory Screens for your hospital	230	2.3	Not Met	162	1.5	Not Met	142	1.4	Not Met	534	1.7	Not Met
Unsatisfactory Screens for state	230	2.3	Not Met	162	1.5	Not Met	142	1.4	Not Met	534	1.7	Not Met
Birth certificates for your hospital*	8,500			9,136			8,752			26,388		
Birth certificates for state*	8,500			9,136			8,752			26,388		
Newborn Screening Card Number for your hospital	8,170	96.1	Met	8,664	94.8	Not Met	8,307	94.9	Not Met	25,141	95.3	Met
Newborn Screening Card Number for state	8,170	96.1	Met	8,664	94.8	Not Met	8,307	94.9	Not Met	25,141	95.3	Met
Returned BioTrust for Health Consent Forms for your hospital	7,638	82.8	Not Met	8,088	82.2	Not Met	7,697	81.6	Not Met	23,423	82.2	Not Met
Returned BioTrust for Health Consent Forms for state	7,638	82.8	Not Met	8,088	82.2	Not Met	7,697	81.6	Not Met	23,423	82.2	Not Met
*Reported Pulse Oximetry Screening Results** for your hospital*	4,930	53.4	Not Met	5,562	56.5	Not Met	4,911	52.1	Not Met	15,403	54	Not Met
*Reported Pulse Oximetry Screening Results** for state*	4,930	53.4	Not Met	5,562	56.5	Not Met	4,911	52.1	Not Met	15,403	54	Not Met

**This is a preliminary estimate excluding all birth certificates with NICU admission marked on the birth certificate.*
The number of birth certificates may be different than the number of specimens due to several factors including screening refusals, increased length of time between birth and release of birth certificate to the State, and inclusion of birth certificates of infants in the NICU or SCN if that information was not marked on the birth certificate.

***This number may be an under-estimate for some hospitals as additional records may have been received but a link was not able to be made to the newborn screen blood spot screen based on demographics provided. This is usually related to a missing or incorrect newborn screening kit number.*

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Evaluating Performance

* Original measure:
  * Percent of specimens received within 72 hours of collection
* Strengths
  * Easy to understand
  * Easy to calculate
* Weaknesses
  * Doesn't identify hospitals that could improve timeliness
  * Can't adjust for weekends and varying pickup times

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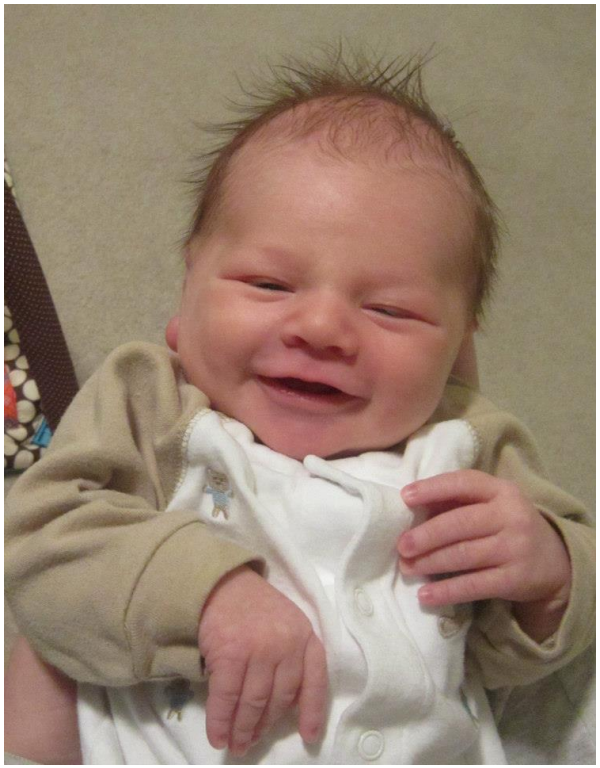
Example

* Child born on Tuesday at 3:40 am.
* Screen collected on Wednesday at 5:00 am.
* Courier picks up specimens on weekdays at 11:00 pm.
* Specimen arrived in state lab on Friday morning.
  * ~48 hours after collection
  * Should have arrived one day earlier



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Solution

* Needed to create hospital-specific cutoffs that account for:
  * Specimen collection time
  * Specimen collection day
  * Courier pickup time for each day
* Allow for better monitoring of transit time performance

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Methods

* Nurse consultant created a spreadsheet:
  * Pickup time for Monday-Friday and weekend day and time
  * Late deliveries that are not the hospital's fault
* CLSI guidelines recommend drying NBS specimens at least 3 hours
* Additional time may be needed for preparing specimens for shipping and transporting specimens to the designated pickup location
* Allow a 5 hour cushion between specimen collection time and earliest possible pickup time

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Methods

* Developed hospital-specific cutoffs for determining if specimens are received in the lab on or before the appropriate day

Saturday courier service:

Assume Hospital 1 has pickup Monday-Friday at 5:00 pm and Saturday at 1:00 pm:

Specimen Collection Time	Should arrive on or before*
Friday after 12:00 pm - Saturday at 8:00 am	Monday
Saturday after 8:00 am - Monday at 12:00 pm	Tuesday
Monday after 12:00 pm - Tuesday at 12:00 pm	Wednesday
Tuesday after 12:00 pm - Wednesday at 12:00 pm	Thursday
Wednesday after 12:00 pm - Thursday at 12:00 pm	Friday
Thursday after 12:00 pm - Friday at 12:00 pm	Saturday

Sunday courier service:

Assume Hospital 2 has pickup Monday-Friday at 9:00 pm and Sunday at 3:00 pm:

Specimen Collection Time	Should arrive on or before*
Friday after 4:00 pm - Sunday at 10:00 am	Monday
Sunday after 10:00 am - Monday at 4:00 pm	Tuesday
Monday after 4:00 pm - Tuesday at 4:00 pm	Wednesday
Tuesday after 4:00 pm - Wednesday at 4:00 pm	Thursday
Wednesday after 4:00 pm - Thursday at 4:00 pm	Friday
Thursday after 4:00 pm - Friday at 4:00 pm	Saturday

Preparing Hospitals

* Described new measure:
  * NBS Regional Trainings in 2014
  * NBS quarterly newsletter
  * Email with quarterly reports

Important Changes to NBS Quarterly Reports

From the second quarter of 2014 on, your NBS quarterly report measures will change. Two measures will be removed, and two new measures will be included.

The courier measure (≥90% of screens arrive in state laboratory ≤4 days after collection) and the batching measure (<2% of envelopes are batched) will be removed and replaced with a measure related to specimens being received on or before the appropriate day. A database has been created with the specimen pickup time for Monday-Friday and the weekend day and time for every birthing unit in the state. Since hospitals are advised to dry specimens for at least 3 hours and time may be needed to prepare specimens for shipping, we allowed for a 5-hour cushion between collection time and the earliest possible pickup time. We then developed hospital-specific cutoffs for determining whether specimens were received in the state laboratory by the appropriate day based on collection time and each hospital's courier pickup times. The goal for the new measure is that >90% of screens arrive in the state laboratory by the appropriate day.

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Examples of Receipt by Appropriate Day

* Hospital Y has a Monday-Friday pickup at 6 pm and a Sunday pickup at 4 pm
  * Are the following specimens received by the appropriate day?

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Mon-Fri 6 PM; Sun 4 PM

* Collected 2 pm on Thursday and received on Saturday
  * Yes
* Collected 10 am on Sunday and received on Tuesday
  * No
* Collected 2 pm on Friday and received on Saturday
  * Yes

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Results

Time Period	1st Quarter 2014	2nd Quarter 2014
Goal	≥90% of specimens received within 72 hours of collection	≥90% of specimens received on or before appropriate day
Statewide	96.1%	80.8%
Number of units meeting goal	91/116 (78.5%)	35/117 (29.9%)
Hospital X	98.0%	61.6%

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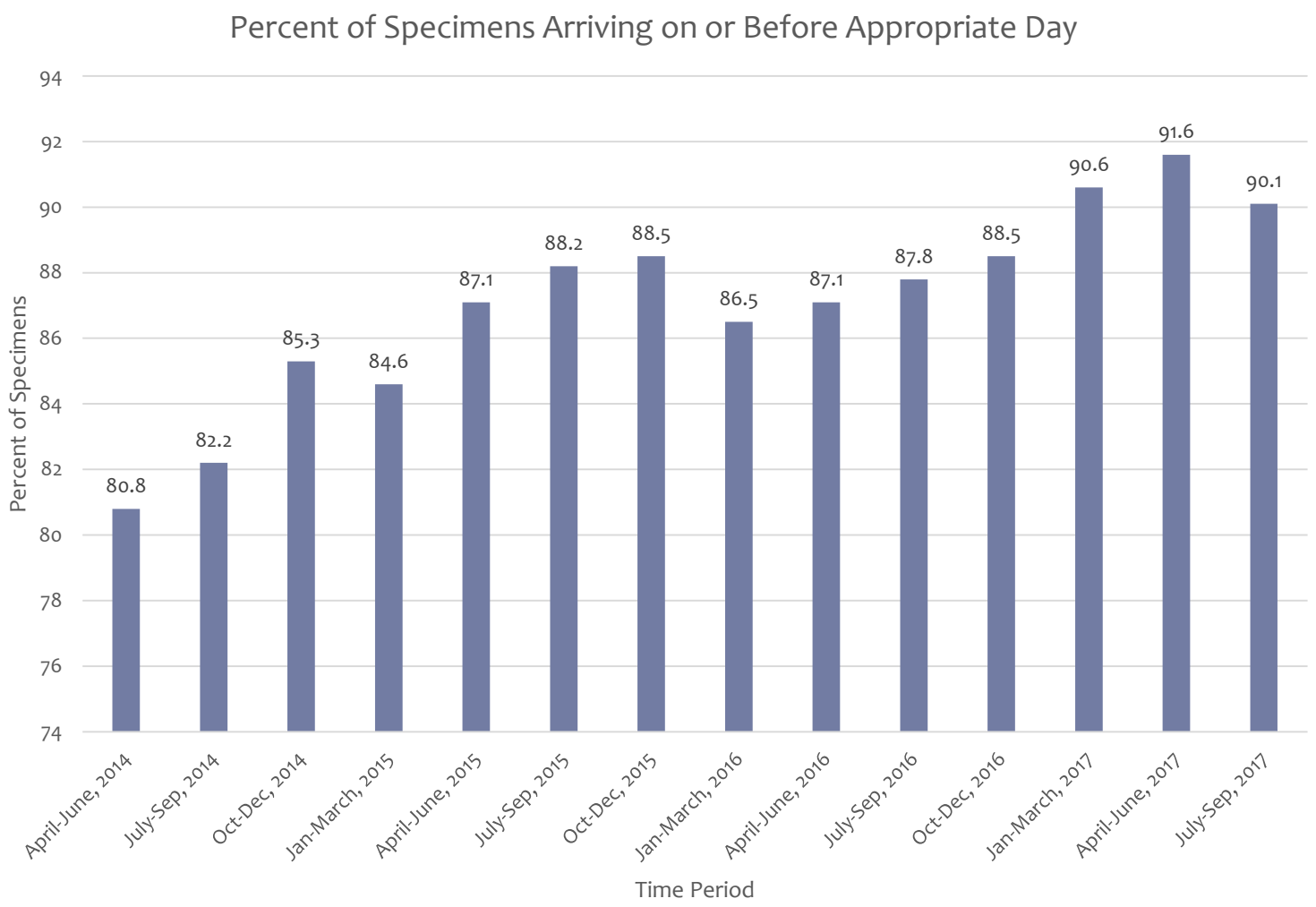
Results



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Results

* July 1-September 30, 2017
* Of 28,998 first sample specimens, 26,115 (90.1%) were received in the NBS lab by the appropriate day
* Of 111 units, 62 (56%) had >90% of specimens received by the appropriate day
  * 54 regular nursery
  * 6 NICU
  * 2 SCN

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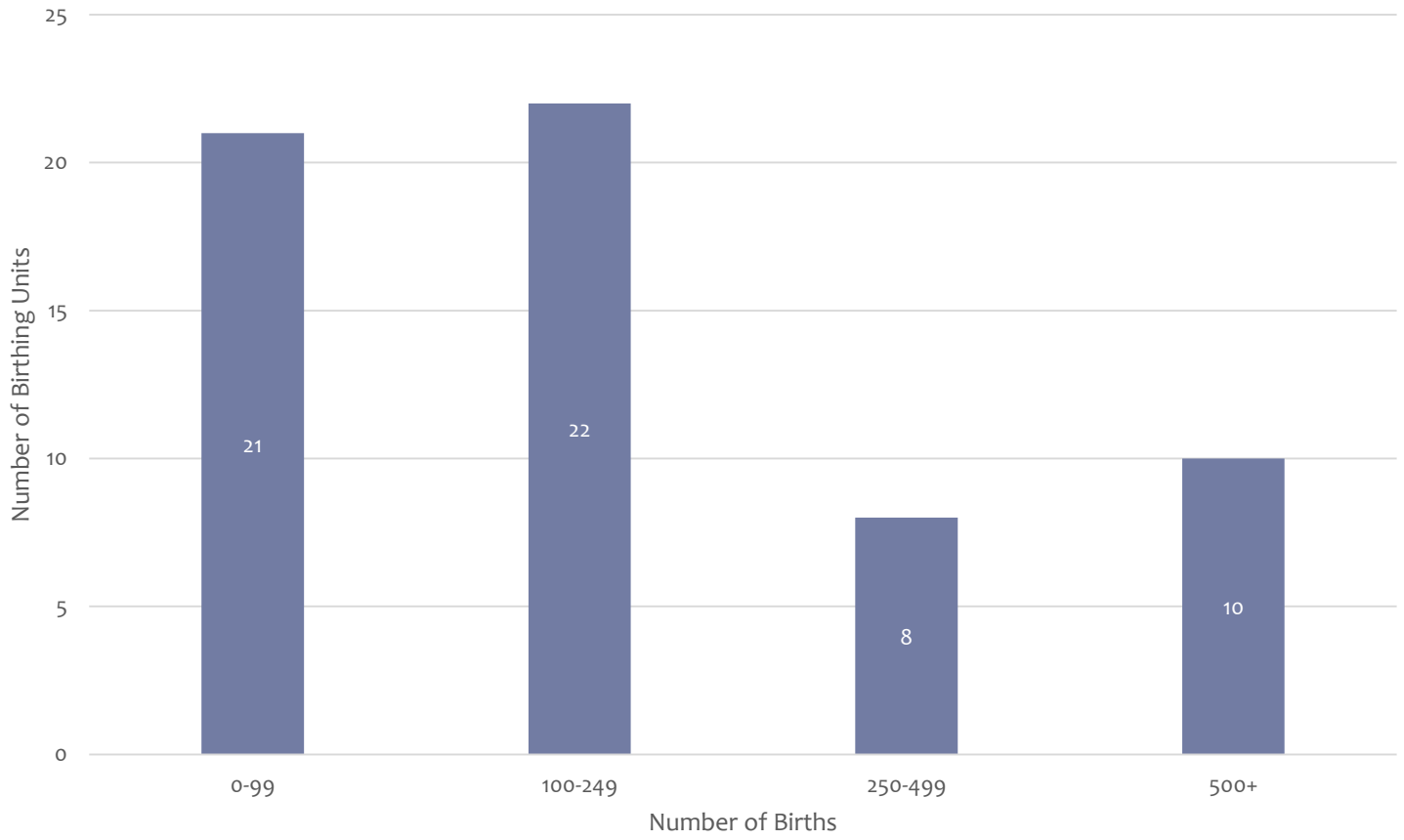
Results

Number of Births among Units with >90% of Specimens Arriving by the Appropriate Day, July 1-September 30, 3017



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Quarterly Reports Follow-up

* Receipt by appropriate day measure included on quarterly reports

* Nurse consultant provides technical assistance to hospitals with lowest percentage of specimens received by the appropriate day

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Technical Assistance Provided

* Information about each specimen received the previous quarter
* Nurse consultant meets with key hospital staff
* Staff discusses each component of their newborn screening process
* Ways to improve specimen transit are identified

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Common Findings

* Limited knowledge of entire NBS process
* Specimens collected on time but left on unit too long
* No logs or insufficient logs kept
* No provision made for assigned staff person's absence
* Specimens processed for pickup once a day

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Process Changes

* Increase education to staff involved in NBS process
* Maintain NBS log on floor
* Assign staff to perform ‘sweeps’ at specified times each day
* Maintain a courier log

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Challenges

* Maintaining an up-to-date courier database is time-consuming
* Buy-in of key hospital staff is needed
* Code to determine appropriate day is cumbersome to create and update
  * **New method developed to allow for updating courier pick-up time**

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Conclusions

* Use of hospital-specific cutoffs for assessing time from specimen collection to receipt in the NBS lab identifies hospitals that could improve their process for sending out specimens in a timely manner

* Birthing units meeting the goal of 90% of specimens arriving by the appropriate day displayed size and geographic variability

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Thank you!

* Mary Kleyn
  * Manager, Newborn Screening Follow-up
  * kleynm@michigan.gov

* Lois Turbett
  * Nurse Consultant, Newborn Screening Follow-up
  * turbettl@michigan.gov

* Isabel Hurden
  * Epidemiologist, Newborn Screening Follow-up
  * hurdeni@michigan.gov

* www.michigan.gov/newbornscreening

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